The Open Court.

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RECENT CONTRIBUTIONS TO "THE OPEN COURT."

PROF. E. D. COPE.

In Number 23 Professor E. D. Cope treats of "Evolution and Idealism," and finds in the evidence of evolution the refutation of the doctrine of idealism. He concedes that much of what we consider the objective world is unreal and has no existence, except, as we perceive it, like the snakes, for instance, to the victim of *delirium tremens;* and he agrees that "the properties of matter" owe much of their character, and even their existence, to our senses, which give matter all its qualities, or, at least, modify and change them according to the number of our senses and their ability to perceive. Yet, for all that, he says: "If a given supposed object be purely a mental state on the part of the subject, a rational cause for the production of that state is wanting."

With great self-confidence, Professor Cope says: "Evolution gives the *coup de grace* to idealism of the consistent type. In the gradual unfolding of organic life it sees the two universal facts, subject and object. It sees them interact and influence each other," and further on he says: "It is equally competent for the materialist to deny the existence of mind as for the idealist to deny the existence of matter. The materialist beholding the imperfection of the senses may pronounce them to be, one by one, incompetent witnesses, and declare them to be illusions. But the fact is, both exist, object and subject, matter and mind."

MORRISON I. SWIFT.

In No. 23 Morrison I. Swift makes a vigorous appeal to the churches that they become actively interested in what is generally known as "The Social Problem," and that they take the lead in Christianizing the people after the manner practiced by Jesus in Judea and by his disciples, as related in the New Testament. Mr. Swift's language is clear, eloquent, pervaded by an ideal humanitarianism, and is not only respectful to the clergy but even reverent. He thinks the opportunities of the present and the future are in the hands of the churches, and that the clergy may lead the van of social progress instead of trailing along behind the baggage wagons, as they have so long been contented to do. "In this country," he says, "where the church has the allegiance of so large a portion of the people, where it represents a large proportion of the specially organized moral forces of the land, where finally its material resources are almost unlimited and the money power of the country is its friend and supporter, it would be possible for the church to bring about the reform that is needed, with little difficulty, if it desired to do so." Here Mr. Swift is confronted with the important objection that should the church take the lead in the social revolution or even in social reformation so far as "to establish such fair distribution of the products of human industry that superabundance and luxury will not exist," the "money power of the country" would cease to be its "friend and supporter" and the clergy might cease to be a priesthood. He presents the difficulty thus: "It is said by some that the pulpit will not go much beyond those who maintain it. This is to acknowledge that the opinions of the clergy are to-day bought and paid for, just as lawyers are hired and legislators sent to uphold the ideas of their constituency." Notwithstanding this difficulty, Mr. Swift sees "a slumbering lion in the Christian ministry, which will, ere long, awaken and put forth its formidable powers for the poor and the oppressed."

Two other essays by Morrison I. Swift, are contained in Nos. 32 and 44. In the one he speaks of *The Scholar as a Reformer*, and in the other of *The Masses as Reformers*. The scholar has imbibed something of the historic spirit; he perceives, moreover, that the change in human institutions must ever be along the line of the moral and the ideal. Life can not be conceived in its full import, until the individual comprehends himself as the bearer of the rare essence and as containing, in no merely figurative way, the temporal hereafter. It is the mission of the scholar to reveal the larger and encompassing world of his soul, not of the bookish professional scholar but of him who has sought a profound comprehension of the meaning of life in its complexity and breadth. He must guide the masses, he must clear away the mystifying creeds and establish the truth that all men are born to live moral and beautiful and expanding lives in whatever sphere they may labor.

Mr. Swift considers the masses as the raw material for reform. There are rich people who think that general betterment means loss to them. But to dread reform is to misunderstand. Whatever is imperfect in society is injurious to all classes. A reform at one point reaches every point. The essayist sets great hopes on the masses—indeed, hopes too great, which may prove illusions. "Their minds," he concludes, "are more fluid and therefore they are more capable of growth into a surviving harmony with the conditions of life than those whose adaptations were formed earlier and in less enlightened times.... They are to become an infinitely more important factor in the life of the race than ever before."....

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THE PSYCHIC LIFE OF MICRO-ORGANISMS.*

BY A. BINET.

Translated from the "Revue Philosophique" by Δφμκ.

PART II.

THE MOTORY ORGANS AND THE ORGANS OF SENSE. (*Continued.*)

The Flagellum. The study of the third organ of locomotion, the flagellum, brings us to speak of the class of Mastigophores and more particularly of the group Flagellata. The Flagellates are Protozoa of very small size, all in all, very much smaller than the ciliated Infusoria. They have no vibratile cilia at all, but they are always equipped with one or more filamentous appendages which have the form of a long lash. This is the flagellum. This lash, like all the organs of locomotion hitherto studied, has two functions: it is at once an organ of locomotion and an organ of prehension. The flagellum is most frequently single or double (see fig. 4, representing the *Euglenadeses* with its single flagellum); sometimes a person can count a much larger number of them, four, six, eight, ten, and more. As regards the insertion, the same variations are met with. Some times the flagella are very numerous and seem to be planted on the same point of the surface of the body, thus forming a brush or plume. In other species we find several flagella arising in the anterior extremity of the body, directed forwards, and also posterior or caudal filaments which are turned toward the rear. This is observed in the genus *Trichomonas;* the anterior flagella serve for purposes of locomotion, perhaps also for the prehension of food; the posterior flagella, on the contrary, are solely organs of locomotion; they resemble a trailing tail and perform the functions of a rudder.

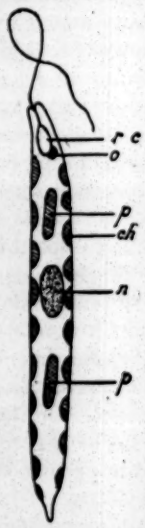

Fig. 4.
Euglenadeses.

r. c. — contractile reservoir; *o.* — eye; *p.* — disk of the paramylone; *ch.* — chromatophores; *n.* — nucleus.

In passing we may point out the great morphological resemblance between the Flagellata and the spermatozoa of animals, the antherozoa and the zoöspores of plants. The organs of propulsion in these beings are the same.

The Protozoan with its flagellum executes the most varied movements, moving first in one direction, then in another, and in different planes; sometimes the animal curves about entirely; but most frequently, when he uses it as an organ of prehension, he extends it its whole length before himself; the basilar part remains completely immovable and rigid, while the free end alone executes movements destined to drive food to the mouth, which is generally situated at the base of the flagellum. Ehrenberg gives to the flagellum the name proboscis; its peculiar mobility renders it worthy of this name. The flagellum, like the vibratile cilium, is an expansion of the protoplasm through the enveloping membrane. M. Certes has observed a Protozoan, the flagellum of which between whiles re-entered into the mass of the body, with which it mingled; it was replaced by a pseudopod which soon attenuated and took the form of a flagellum.

Bütschli has recently made a very interesting observation on this organ of locomotion. Under certain circumstances, the Peridinia (Dinoflagellates) throw off their long flagellum and enter into a state of repose; they generate them quite as easily. In the *Glenodinium cinctum*, Bütschli has seen the flagellum roll itself up first like a cork-screw, and then suddenly detach itself from the animal; having become free, it stirs about in the water for several minutes before becoming motionless. This observation enables us to refute those naturalists who believe that the vibratile cilium is an appendage of the cuticle, by bringing forward the fact that when the cilia with the portion of the cuticle in which they are inserted are separated from the cell, the cilia continue to move; we have just seen that the flagellum moves even after it is separated from the cuticle; this persistence of movement is sufficiently explained by the protoplasmic nature of the cilia and of the flagellum.

From another point of view, the observation of Bütschli gives us a curious example of the phenomena of *autotomy*, which have recently been studied by Frédéricq.

The pseudopodia, the vibratile cilia, and the flagellum, constitute the three motor organs that are most frequently found in the kingdom of the Protista. Among the Infusoria, moreover, particular differentiations of the protoplasm have been described, which

* Translation copyrighted.

may be compared to the muscular fibres of the higher animals. The Vorticellæ are supported by contractile peduncles. These are filaments capable of rolling themselves up into the form of a cork-screw, when the animal is disturbed. Certain Infusoria can modify the form of their body by a sudden contraction: they have been called *metabolic*; such are the Stentors, the Prorodons, the Spirostomes. In contradistinction, those which do not change their form, for example the Parameciæ, have been called ametabolic. According to the observations of Lieberkühn, which date back to 1857, the metabolic Infusoria have their bodies divided into large granulous bands, separated by bright filaments. It has been asked which is the contractile element: is it the band, or is it the filament? Oscar Schmidt, Kölliker, Stein, and Rouget think that it is the band which is the contractile element. This opinion is based on the following fact, which M. Rouget was the first to observe: at the moment at which the animal contracts, the band presents transverse stria; this appearance is due to the fact that the bands contain in the state of rest small granules which, during the contraction of the animal, are disposed in transverse series, so as to recall the *sarcous elements* of Bowman.

Lieberkühn, Greef, and Engelmann attribute the active part to the bright fibre. Engelmann has based his opinion on the fact that he recognized in the filament the property of double refraction, which, according to him, belongs to all contractile substances, while the substance which separates the filaments shows only single refraction.

However that may be, it is one of these two elements that possesses the power of contraction, and which deserves the name of *myophane*, which Haeckel gave it. It it very remarkable that in the Stentors and the Spirostomes the fibrillous stria are in intimate connection with the basilar extremity of the vibratile cilia. In the Vorticellæ one can clearly see the fibrils converge toward the axis of the style, the contractile element of which they constitute.

We shall not leave the study of the motor organs without saying a word about the rhythmical movements which can be seen in the contractile vesicle of the Micro-organisms, vegetable as well as animal. This vesicle is a small cavity which is dug into the protoplasm, and which alternately increases and diminishes its capacity. Scientists by no means agree as to its exact function; Bütschli and Stein consider it to be a secretive apparatus. Its pulsations are very regular. Their number is constant in every species. In the *chilodon cucullulus*, a pulsation occurs every two seconds; in the *Crytochium nigricans*, every three seconds; in the Vorticellæ, every eight seconds; in the *Euplotes*, every twenty-eight seconds; in the *Acineria incurvata*, every six minutes; Rossbach, whose curious experiments with the vibratile cilia and the cirri we have already cited, has made analogous experiments with the contractile vesicles. He observed especially that, under the action of alkaloids, the contractile vesicle ceased pulsating in diastole, and dilated enormously; but poisonous agents do not act all at once on the movements of the vesicle; they begin by paralyzing the larger cilia, which are under the influence of the will. The movements of the vesicle, like those of the small cilia, persist for a much longer time. M. E. Maupas has seen Parameciæ, killed by a discharge of trichocysts, become completely immobile, with their vibratile cilia inert and rigid, while the contractile vesicle continued to pulsate with the same activity; this activity continued for an hour.

We have now briefly examined the morphology of the motor organs of Micro-organisms.

It is very difficult to determine the physiological process of the movements produced by these organs. The simplest movements and the ones most easily understood, are those by which a cell suddenly and strongly irritated withdraws its prolongations and assumes a spherical form; this change of form can be explained by a quick condensation of the protoplasm, which becomes the seat of a phenomenon similar to that of a contracting muscle. The sudden modifications which are observed to take place in the form of the so-called metabolic Infusoria are in this way explained by an analogous phenomenon, so much the more evident as the Infusoria which possess this property, show in the cortical layer of their protoplasm (ectosarc) granulous bands which have with more or less justice been compared to the muscles of the higher animals. The displacements of the body determined by the pseudopodia, by the vibratile cilia, and by the flagellum are much more difficult to interpret; meanwhile it is probable that the movement proceeds from the contractions of the protoplasm which are produced either in the ectosarc or in the motor organ itself; the latter is automobile, as is seen, for example, when a flagellum separated from the rest of the body continues to move in the liquid.

It is well known that any number of discussions have been raised as to the manner in which the pedicel on which the Vorticellæ are mounted, contracts. Still more obscure is the oscillatory movement of the Bacteria. These small beings are very mobile when they find themselves in a liquid; they frequently exhibit a movement of oscillation which sometimes carries them forward, sometimes backwards. An attempt has been made to explain these movements by postulating the presence of organs of locomotion, extremely slender filaments planted at one of the extremities of the Bacteria like small rods; but the existence of these

organs has not been absolutely proved. Even more obscure is the movement observed in certain Gregarines. It would seem that in the case of these animals, which are often of considerable size, one ought to be able to understand the principle of their movements much more easily than in the case of such small beings as the Bacteria; but this is not the case. The Polycystids have a very peculiar manner of moving; the motion is one of perfect translation, uniform and rectilinear; the animal seems to slide all of a piece over the object-plate; it can go to the right, to the left, stay its motion and resume it again; it is free in directing its movements. Now, during this movement nothing can be seen to take place in the body from within or without. An analogous phenomenon is to be observed in the Diatomes. Some scientists have wished to explain the mysterious motion by translation executed by the Gregarines, as being due to an imperceptible undulation of the sarcode; but if there were any undulations whatever, one ought to observe a correlative movement in the granules inside; now this is something that is never seen.

Thus there still exists a great deal of obscurity concerning the principles determining motion among the Proto-organisms. The theories based upon muscular contraction that have been propounded from observing higher animals, are by no means sufficient to explain the phenomena of motility among certain Protozoa and Protophytes.

Nervous System. Hitherto not the minutest trace of a central nervous system has been found in a single Proto-organism. The nervous function among these inferior beings devolves upon the protoplasm, which is irritable, which feels and which moves, and which, in certain species, as we shall see later on, is even capable of performing certain psychic acts, the complexity of which seems quite out of proportion to the small quantity of ponderable matter which serves as a substratum to these phenomena. There is, moreover, no occasion to be surprised that an undifferentiated mass of protoplasm should be able to exercise the functions of a veritable nervous system. In fact every nervous element is nothing else than the product of protoplasmic differentiation; the protoplasm embodies in itself all the functions that, in consequence of an ulterior division of labor among the pluricellular organisms, have been assigned to distinct elements.

It has rightly been held, therefore, that if no nervous system, anatomically differentiated, existed in proto-organisms, it must be admitted that their protoplasm contains a *diffused nervous system.* Among all the observations that uphold this idea, we must cite one to which M. Gruber, a professor at Freiburg, in Breisgau, has recently called attention. This observation was made on a large, ciliated Infusory, the Stentor, of which mention will be made so often hereafter that it will be advantageous to give a full description of it beforehand.

The Stentor has an elongated body, broadened in front like a funnel, and able to fasten itself by its posterior extremity. The edge of its peristome is covered by a belt of vibratile cilia disposed about a spiral line. The mouth occupies the most sunken part of the peristome.

The body of the animal is striated with longitudinal bands; at the plane of the peristome, these bands take a different direction: they become transversal and spiral. In the interior of the protoplasm can be observed a contractile vacuole and a nucleus like a string of beads, made up of a large number of grains. This Infusory, like all the Ciliates, multiplies by fission; a contraction is seen to take place in the middle of the body; the segment below the contraction generates a peristome similar to that of the upper segment; then a second contractile vacuole is formed, and soon the two segments represent two complete animals which possess all their organs. Nevertheless, the two Stentors continue to be united for a certain length of time by a bridge of matter, located even with the point where the contraction took place; this bridge of matter gradually grows thinner and thinner and becomes as fine as a thread. (See fig. 5.) Now, Gruber has observed that the two Stentors united by this bridge of protoplasm exhibit perfect harmony in their movements; they always sway in the same direction at the same time; and this harmony is necessary, because the least contrariety of motion would suffice to break the feeble bond that unites them. Moreover, their vibratile cilia beat in unison. To explain this concordance in the movements of the two animals, Gruber assumes that the entire mass of their protoplasm performs the function of a diffused nervous system, which has the effect of regulating their movements and of making them harmonize.

Fig. 5. Stentor in process of division.

We might add that the Infusoria possess not only a diffused nervous system, but that they must of necessity possess special nerve centres, endowed with different functions.

It will be remembered in fact that, under the influence of certain poisonous agents, death is not simultaneous throughout all parts of the organism. What ceases first are the voluntary movements of the large

cilia; the movements of the small cilia are able to persist much longer; and finally, when all the cilia have become immobile and rigid, the vesicle has still been seen to pulsate for an hour. This gradual death recalls what we remark among the Vertebrates; under the influence of poisonous agents, the brain dies first, then follows the marrow, and lastly the bulb, which is the *ultimum moriens*.

(To be continued.)

REMINISCENCES OF MR. ALCOTT'S CONVERSATIONS.

BY MRS. EDNAH D. CHENEY.

PART II.

The different way in which he and Mr. Parker regarded Jesus's severe denunciations of the Scribes and Pharisees was characteristic. Mr. Alcott thought they were spoken with such divine serenity that nobody's feelings were hurt, but Mr. Parker said, "No man uttered those words without his pulse running up to a hundred and twenty, and his heart beating as if it would burst out of his bosom."

A witty lady once said Mr. Alcott was "so much of a lamb, he was a little bit of a sheep;" but he had weapons of defence, wit, sarcasm, and irony, which he could use on occasion.

A lady once saying to him, "Mr. Alcott, why have you not come to see me, as you ought to have done?" he replied, "There are many oughts, some of them quite as important as Mrs. ——."

To a person who was very much troubled about the Free Love movements, saying, "I ought to do something about them. What shall I do? I wish some one would tell me what to do," he quietly replied, "Meantime, there is Providence."

It is easy to understand that it is far more possible to give such salient exceptions to the usual tenor of the conversation, than any idea of the real height and depth of his thought; you must seek for that in his writings and in the noble criticism of his philosophy we shall have from the one, I may almost say, alone able to give it to us.

While Mr. Alcott's only means of earning money at this time was from these conversations, it was very hard for him to make a pecuniary bargain for them, and he was so unskillful in money matters that one year, in making out his circular, he had put the price of single tickets so low that it was cheaper to buy them all than a ticket for the course. He was very generous in giving free tickets to those who desired them, even to those who added nothing to the pleasure of the company. I remember one woman, somewhat crazed in mind, who occasionally threw the company into convulsions of laughter by her ill-timed remarks, but whom he bore with patiently, always giving her free tickets and escorting her down to the North End after the conversation was over, because he did not think it safe for her to go alone.

With all his seeming unpracticality, Mr. Alcott was not slipshod in his arrangements. He loved thoroughness, good form, good manners. He was never unpunctual either in opening or closing the conversation. He respected his audience and treated them with justice.

The greatest advantage gained from the Town and Country Club established about this time was, that it gave Mr. Alcott a large room in which to hold conversations, and as he thus had no expense for rent, he indulged himself in inviting the company to take tickets, I am not quite sure whether without pay or not. There were to be four conversations, and it was hoped that none would be present but those who felt real interest in him, and who would not be liable to misunderstand him. It hardly proved so, however, for his abounding generosity would not allow him to refuse a ticket to any one who wished it, and as Mr. Emerson's name was joined in the invitation, many wished to attend from curiosity or a very superficial interest. The room was generally crowded. Miss Bremer was once or twice among the guests, very much delighted, but not quite agreeing with his theories. Mr. Emerson came and kept his promise to speak, although with painful effort as he shrank from extemporaneous speech. Among others was a Jewish gentleman who objected to everything other people believed in and who annoyed Mr. Alcott more than I ever saw any one else do. "That raised Lazarus," was his common expression for him. Mr. Sumner was among the guests, and Dr. Elder of Philadelphia. I think it was this winter that Mr. Lowell was occasionally present, and tried to catch Mr. Alcott in some of his theories, but his good genius usually saved him.

In 1851, Mr. Alcott managed his conversations in a novel way, which brought out his rare power of appreciating and delineating character. He proposed a series of seven conversations of Representative men, most of them living and all of our own times.

He first spoke of the true American type as not having yet appeared, and introduced Daniel Webster as not a representative American, not combining all the races which are going to form the new type. He said, "Nature meant to make a noble man, she built the forehead nobly, but the backhead is too powerful even for that, and the crown is wanting. She put in four or five Romans, two or three Saxons, but not the Hebrew. On the plane of the memory and understanding he is great, he deals wisely with affairs, with coarse material interests, but not in the imagination, not in the pure reason, not in the conscience. We do not go to Webster for metaphysics. No mother would ask him how to educate her child."

Mr. Alcott drew a comparison between Webster and Cromwell and added that Webster "lacked the

feminine. He was old too early, and without the feminine we can have no true manhood."

"Not until we get the feminine element in Congress, whether in a man or a woman, shall we have the right spirit there."

He spoke of him as a conservative. "There is," he said, "a true conservatism, but in the popular sense, the conservative is a man behind himself, and behind his times. He is a demonic man." Probably, Webster was the best type of what Mr. Alcott really meant by the Demonic Man. He said also "that the characteristic of the great men of the last century, from Goethe to Webster, had been this duplicity, this divided nature. We see it in Byron, in Coleridge—eminently in Carlyle. Coleridge did not sin as Webster, but he was also guilty of that which prevented his doing the things he was capable of doing. The serene single man is yet wanting."

Mr. Garrison represented the Liberal on the second evening, and the conversation was carried on more by others than usual. Mr. Alcott spoke of the Liberator, as Mr. Garrison's diary and best exponent, and of its value as History. In my abstract I have said that I fear I have not fully presented the broad and ample justice Mr. Alcott did to Mr. Garrison. Theodore Parker was the third topic, and Mr. Alcott called him the representative of "popular rights." "He is a great Saxon, with perhaps a little of the Roman. He speaks a thing because it is so, not because he will have it so. We have said all when we have called him 'a man.' Books and libraries serve him, he serves humanity."

"If Mr. Parker is not our priest, he indicates him. He is the silence of the priest, greater than his speech. He moves us not by words alone, but by his port, manner, disposition. There is a soul alive deified in him. He is pre-eminently gifted to operate on the people's heart."

Even in re-reading my poor abstract, I am very much struck with the genial appreciation which Mr. Alcott showed of one so unlike himself. Mr. Parker did not quite suit his imagination, but his heart and conscience responded to him.

Mr. Wm. Henry Channing was the subject of the next discussion. Of him Mr. Alcott said, "He partakes more largely of the fluid element, he is liberated and freed and is an enthusiast. Mr. Channing has not a great imagination, but a lively fancy. As Mr. Parker represents Rights, he represents Love." In answer to a question as to Mr. Channing's failure, Mr. Alcott said, "That is failure when a man's idea ruins *him*, when he is dwarfed and killed by it, but when he is ever growing by it, ever true to it, and does not lose it by any partial or immediate failures—that is success whatever it seems to the world." Again, he said, "True discrimination can come only from a genuine love. It is the paint for our canvass-portrait. He only can truly paint the Devil who for the time loves him!"

I am sorry to find my abstracts of the remaining evenings quite incomplete. Of Dr. Wm. Ellery Channing he spoke as among men of sentiment. My impression of the evening is that he hardly accounted for the wide mark which Dr. Channing has made, but he summed up the conversation thus:

"It is character that does the work. We have one man here who knows how to do his work, he hits the nail on the head. It is not the hammer that hits the nail, it is the man that holds it."

Of the discussion of Mr. Emerson, I have unfortunately no record, I was absent from illness, but it was reported to me as very beautiful. Neither have I any abstract of the conversation on Margaret Fuller as the representative of woman, but in a private letter written at the time, I speak of it as a painful disappointment, so that I sat in agony until I resigned the evening as hopelessly lost. It appears to have been taken out of Mr. Alcott's hands. An old-school physician made a disagreeable attack on Harriet K. Hunt and the Medical College, at which all the company were indignant and which she very properly answered:

Those who love poetical justice may be glad to know that this same physician, very high in his profession, from a bitter opponent became a kind advocate and most helpful friend to women physicians.

Mr. Alcott, however, as well as Mr. Higginson, spoke very beautifully of Margaret Fuller, as I have also recorded his doing in private conversation. I am sorry that I have not his words, for it is a popular error to suppose that these two noble souls were not in cordial harmony of feeling, although so different in expression. Mr. Alcott summed up these conversations as a series of seven pictures.

Our first, Mr. Webster, was a colossal bronze statue.

Our second, Mr. Garrison, was a phrenological head illuminated.

Our third, Mr. Parker, was a bold crayon drawing, wanting in some richness of coloring, but still a good crayon sketch—we were pretty well satisfied with it.

Our fourth, Mr. Channing, was a profile.

Our fifth, Margaret Fuller, was only an outline with the features left out and is left on the easel, it is not yet painted.

Our sixth, Mr. Emerson, was a finely cut medallion and when it was done we fell in love with it ourselves.

Our seventh, Dr. Channing, we hoped would be a miniature. It has not been quite perfect, but we guess it is a miniature.

A new course of fifteen lectures was proposed (on

what I have in a letter disrespectfully called the old fellows, by which I presume was meant the philosophers) from Hermes to Goethe.

I think this course was never given. I have no record or remembrance of it.

Beside these public courses Mr. Alcott had occasionally classes of young ladies, to whom he read from the philosophers and poets. Sometimes he required us to write, transposing a poem into prose. Wordsworth's "Intimations of Immortality" was a favorite subject for this exercise. He frequently attended the meetings of a class who were reading Plato and gave them inspiration and help in understanding his works.

I find three hours mentioned as the length of one of these lessons and no weariness is expressed.

In 1849, Mr. Emerson gave a course of lectures in Freeman Place Chapel. Mr. Alcott invited his friends to come to his room in West Street, after the lecture, to meet Mr. Emerson. They were delightful hours of free social converse, with the lecture for a subject of discussion interesting to all. One evening I noted as present, Mr. Alcott, Mr. Emerson, Mr. Lowell, Mrs. Holland, Mrs. Payne, Mr. and Mrs. Whipple, Mr. Gould, Mr. Woodman, Mr. Fernald, Miss Sarah Dana and others. Mr. Parker was usually there, and Miss Peabody.

It is difficult to show by any figures or even any definite statement of theories or principles, the result of all this work of Mr. Alcott's. For myself, I find his influence so inwoven with all my reading and my hearing at that time, so rich in intellectual life, that I cannot refer things very decidedly to his teaching, but the stimulus to thought was very great. Every subject was treated in its highest relations. No personal or party aims crept in to bias the judgment. There was no sneer for enthusiasm, no putting down of the standard in ethics to meet temporary exigencies. For the time as was said of one of the company by a wit, we were like "disembodied intelligences" seeking for pure thought. In looking over old correspondence I find many minds responding to this influence, even those who could not receive it directly, and this I believe was the way in which Mr. Alcott's thought was spread abroad in wider and wider circles until at last many were helped who never knew from whence the first impulse came.

Yet there were those who did not then and never have accepted this teacher. He had to be content with the recognition of the few who were like-minded or receptive, and leave others to study the great problem by other methods. He had his limitations, but they were not rigid bars. He was unique in his special power, and there were enough to translate the music of his thought into the language of the world.

In speaking of his teaching and his relation to children I think these same limitations must be borne in mind. I wish very much that we could have the testimony of those who were his scholars in childhood. I find a great discrepancy in their views, and am constrained to think he had the same power of impressing a few deeply while he could not influence others at all, with children as with grown people. I know of one pupil, that, in the language of her wise aunt, "he opened her mind," and they felt she was a changed being from his instructions, while others will not confess to any benefit and have kept the same indifference through life. I think he regarded the child too abstractly as an angel, and did not always see what was working in the pupil's thought or what was merely an attempt to reflect his suggestions. He could hardly escape this illusion entirely.

How lasting and wide his influence will become, I cannot venture to predict, but unique and beneficent as it was, to those near to him, I cannot think that it will be lost, but will continue to fashion the thoughts and minds of those who find they can breathe in his atmosphere as in their native air.

If the form of conversation to which he committed his thought seem slight and perishable, we must remember that words are as lasting as temples and statues, and are all that the greatest of teachers has left to us.

MISCELLANEOUS.

MATHEMATICAL DEMONSTRATION OF THE EXISTENCE OF GOD.*

A STUDY IN LOGIC, BY BARR FERREE.

If we analyze any given effect, we will find that it has been brought about by a series of causes acting one after the other. That is, the cause immediately preceding the effect has been produced by another cause, which in turn has been produced by a third, and so on, thus:—

EFFECT

CAUSE

CAUSE

CAUSE

ETC.

If the analysis is continued indefinitely, we will obtain a series so long that it is impossible not only to number it, but even to conceive of any number sufficiently great to express the relation between the effect and the most distantly removed cause that we can discover. But as this is an unending series we cannot say that more than two terms are separated by this unassignable quantity. For, if we did, we should at once give a value to one of them, which, even though it could not be expressed in numbers, and be only comparative, would be contrary to the meaning of "unassignable." This can be readily illustrated thus: Suppose our series to be represented by a straight line

A———B———C

and let A be the effect whose causes we are examining. Now, if B be a cause removed from A by a number of terms greater than any assignable quantity, it is obvious that there can be no difference between AB and AC, because if there were, then AC would

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be greater than AB, which is impossible, since AB itself is greater than any assignable quantity, and there can, therefore, be nothing greater.

Now this term, which we may call B, cannot be located in space or in thought, for if it could we would at once limit it, which is incompatible with the terms that express it; viz., greater than any assignable quantity. From this it may be argued that there is no such term, and that as we cannot even think of it there is no use of speculating on it. But this is no reason at all. There was a time when the fact that the earth is "round like an orange" was deemed both unthinkable and impossible. Yet now every one believes it, and although we ourselves may not be able to comprehend such a series as has been projected, we have no right to assume that it is an absurdity. And further, if we transpose our series into mathematical terms, and find an expression for this cause B, evolved by the law of the series, we are perfectly justified in comparing its mathematical representative with the representative of A, and thus determining what relation, if any, exists between the two terms. And now we have first to discover the law of the series, and then consider only the first term, and that removed from it by an unassignable quantity.

1) These causes viewed from the position of our original effect are each equally important in its production; in other words, the given effect can only be produced by the action of *all* of them; they are, therefore, each equal in value to each other, and if one of them is omitted, a different effect will ensue. This can be shown algebraically. If the series of causes of an effect be represented by the equation

$$v + w + x + y = A$$

then, if one cause is omitted, since we must take the same thing from each member, we obtain

$$v + w + x + y = A - z$$

which is obviously a very different effect from the first one.

But not only are all the causes necessary to bring about the result A, but no one is of greater importance than the other. For, if it were, let us suppose by the quantity a, we should have, by the simplest rule of algebra, not

$$v + w + x + y + z = A$$

but

$$a + v + w + x + y + z = A + a$$

which is also a different effect from A.

2) Cause is only knowable through effect. Effect is cause manifested. Hence, in order that it be manifest, it is evident that the effect must be contained within it, or otherwise it cannot appear. A parallel case is any number, say 5, which we may say contains 1 and 4, or,

$$5 = 4 + 1$$

or, algebraically,

$$x - y.$$

These, then, are the two characteristics of our series, and we need a mathematical expression for a series whose number of terms is greater than any assignable quantity, and in which (1) each term is equal to each other, and (2) each term, beginning with the first, is included in the term next following.

A multitude of series is at once suggested. The only ones possible are those of powers of a number, and of these only one fulfills the required conditions. It is obvious that the series cannot be

$$a,\ a^2,\ a^3,\ a^4,\ \ldots\ldots\ldots\ldots\ldots\ldots a^\infty$$

for unless $a = 1$, each succeeding term has a greater value than that which precedes it. Neither can it be

$$a,\ a,\ a,\ a,\ a,\ \ldots\ldots\ldots\ldots\ldots\ldots a$$

or

$$a^0,\ a^0,\ a^0,\ a^0,\ a^0,\ \ldots\ldots\ldots\ldots a^0$$

for each term does not contain the preceding. So also the series cannot be

$$1,\ 1^{\frac{1}{2}},\ 1^{\frac{1}{3}},\ 1^{\frac{1}{4}},\ \ldots\ldots\ldots\ldots\ldots\ldots 1^{\frac{1}{\infty}}$$

since Moivre's Theorem, a well-known problem in the Calculus, shows that the roots of unity are not identical:—

$$(\cos x + \sqrt{-1}\sin x)^{\frac{1}{n}} = \cos\frac{x}{n} + \sqrt{-1}\sin\frac{x}{n}$$

Let $x = m\pi$, then

$$(\pm 1)^{\frac{1}{n}} = \cos\frac{m\pi}{n} + \sqrt{-1}\sin\frac{m\pi}{n}$$

substituting the proper value for n we obtain

$$(1)^{\frac{1}{2}} = \pm 1$$
$$(1)^{\frac{1}{3}} = 1,\ \tfrac{1}{2}(-1 \pm \sqrt{-3})$$
$$(1)^{\frac{1}{4}} = \pm 1 \pm \sqrt{-1}$$

and so on.

There is only one other series possible; viz., the series of the integral powers of unity:—

$$1,\ 1^2,\ 1^3,\ 1^4,\ 1^5,\ \ldots\ldots\ldots\ldots\ldots 1^\infty$$

in which, as in all cases, ∞ is the mathematical symbol for a value greater than any assignable value.

This series fulfills the required conditions perfectly, for each term is equal to each other term,

$$1 - 1^2 - 1^3 - 1^4 - 1^5 - 1^6 - 1^7$$

and, further, each term is included in the preceding one. That is, the effect 1 is included in its cause 1^2, which is included in its cause 1^3, which is itself included in its own cause 1^4, and so on indefinitely.

Now a careful examination of this series itself, without any more mathematics, shows that the Ultimate (—First) Cause is totally different from all other causes. 1^∞ includes all possible powers of unity; *i. e.*, includes all the preceding terms of the series, or all possible causes. And as it includes all causes within itself, it is obviously able of itself to produce all phenomena.

But it can be shown in a much more rigid manner that the First Cause is absolutely different from all other causes. This can be done by the easy problem of evaluating the function

$$\left(1 + \frac{1}{x}\right)^x \text{ when } x = \infty, \text{ for } \left(1 + \frac{1}{x}\right)^x\Big]_\infty = 1^\infty$$

Let $x = \frac{1}{z}$ and denote the function by v,

Then $v = (1 + z)^{\frac{1}{z}}\Big]_0$, since when $x = \infty$, $z = 0$

and $\log v = \log\frac{(1 + z)}{z}$ when $z = 0$

Taking derivatives

$$\log v_\infty = \frac{1}{1 + z}\Big]_0 = 1$$

$$\therefore \log\left(1 + \frac{1}{x}\right)^x = 1 \text{ when } x = \infty$$

hence $\left(1 + \frac{1}{x}\right)^x = e$ when $x = \infty$

That is, $1^\infty - e = 2.718281828$, the base of the Naperian system of Logarithms.

We see at once that we have something of which we have no knowledge, and something very different from what has gone before. Our known causes are all 1; the Ultimate Cause is 2.718281828; they are absolutely, infinitely different. Thus mathematical analysis shows that in the beginning there is a Cause, physically Unknowable, Self-Existent, Omnipotent,—GOD.

There is another conclusion that may be drawn from this reasoning. Force being physical cause, we have a perfect right to substitute the word force for cause in the above analysis. Doing

so, we see that the theory of the conservation of energy is not true; for after any force has undergone changes whose number is unassignable or indefinite, it is increased in strength (or value) in the ratio of 1 to 2.718281828.

This latter proposition explains the theory of evolution, and may, perhaps, point the way for its logical demonstration. The lowest forms of life exhibit little vitality or force, the next higher a little more, and so on, increasing more and more. It has long been a matter of speculation whence came this increase. But the reasoning here explains it, for since force increases with infinite change, an infinite number of changes must have taken place before a new form of life was evolved. At the same time it embraces the comforting assurance that the human intellect, increasing with infinite changes, will comprehend yet broader fields of thought than are now open to its vision.

PHILADELPHIA, 1888.

THE FUNCTION OF ZERO IN MATHEMATICS.

The mathematical study, published above and offered by Mr. Barr Ferree "as a curiosity in Logic," is like many serious ontological proofs for the existence of God; it is a trick of *legerdemain* in reasoning. Mr. Ferree undertakes to prove that in the infinite series of effects and causes the ultimate term differs from the other terms. The first cause, 1^{∞}, it is maintained, is totally different from all other causes. This is apparently incorrect, for 1^{∞} (*i. e.*, one taken infinite times) is one just as much as one taken once, or one taken to any imaginable power. We have no objection to comparing the concatenation of causes and effects to an infinite series of

$$1, 1^2, 1^3, 1^4, \ldots\ldots\ldots\ldots 1^{\infty}$$

so as to indicate that in all causal changes the sum total of potential and kinetic energy always remains the same, just as much as

$$1^{\infty} - 1 - 1^2 - 1^3 \text{ etc.}$$

As regards the calculation of the function

$$\left(1 + \frac{1}{x}\right]^x \text{ where } x = \infty$$

we must object to the very first assumption which makes the function -1^{∞}. $\frac{1}{\infty}$ is infinitely small. But we must be careful when using functions of 0 and ∞, always to take into consideration how they originated. In most cases $\frac{1}{\infty}$ is equivalent to zero; yet it can not under all circumstances take its place. The present example is an instance, as will be seen on expanding the function $(1 + \frac{1}{\infty})^{\infty}$. The value of the function $(1 + 0)^{\infty}$ will be seen not to be -1^{∞}, as Mr. Ferree assumes.

The evaluation, being wrong at the start, naturally ends with a contradictory statement

$$1^{\infty} = \varepsilon = 2.718281828.$$

We know that $1^{\infty} = 1$ and can never be the base of the Naperian system of logarithms. It goes without saying that the substitution of the word "force" for "cause" in the above analysis is likewise not allowable.

Aside from these errors, Mr. Ferree's mathematical demonstration of what he calls God, viz a demonstration of something absolutely different from other things, of a term in an infinite series that is essentially different from the other terms, of a cause that is not like other causes, of a number that is no number, and yet wondrously affects all numbers—this demonstration is fundamentally based on the idea of nothingness. Nothing is absolutely different from something. This is a logical statement which is undeniable, and translated into mathematical language, it means 'zero (or nought) is a number which is essentially different from all the other numbers.'

The functions of zero become indefinite and are therefore unreliable in calculations. As a consequence of Mr. Ferree's line of reasoning, God would be not only the infinite but as such also the indefinite; and the latter in mathematics is a function that cannot be trusted, because it leads into errors and wrong statements.

With the assistance of Nothingness in logic and of Zero in mathematics we can perform all kinds of mental somersaults, we can work miracles and make anything out of everything. You wish to prove for the benefit of the trinitarian doctrine that $3 = 1$. You can can do it with the assistance of 0. Multiply the equation with $0 = 0$ and you have $3.0 = 1.0$. Which is a correct equation for both its members are $= 0$. Or, you wish to prove that horses have three tails. This is demonstrable by stating that

No horse has two tails and
One horse has has one tail more than no horse
Ergo one horse has three tails.

Here, it is at once obvious, the negative term "no horse" is used in two different meanings.

These mental somersaults grow more complicated if, in the place of zero, functions of zero are employed. Infinity for instance is "One divided by zero.

$$\infty = \frac{1}{0}.$$

If infinity is no more thought of as a function of zero, but treated as any other number, it can be used as a conjuror's wand which will square the circle and afford mathematical proofs for any impossibility.

EDITOR.

BOOK REVIEWS.

The *Truth Seeker* Company, of 28 Lafayette Place, New York City, have just issued a short sketch of the French Revolution by W. S. Bell, entitled *An Outline of the French Revolution: Its Causes and Results.* The publication is in pamphlet form, and affords a brief but comprehensive view of the period it treats.

ADELAIDE RISTORI. *Famous Women Series.* Boston: Roberts Bros.

This is a charming autobiography, written with great candor and simplicity, and forms a unique addition to a series of works that has won deserved praise. Mme. Ristori gives us a complete story of her life from the time of her first appearance on the stage at the age of three months. The chapters relating her first trip abroad and visit to France where she was brought into direct competition with the artist Rachel are remarkably well told and full of interest.

C. P. W.

NEGRO MYTHS FROM THE GEORGIA COAST. Told in the Vernacular. By *Charles C. Jones, Jr.*, LL. D. Boston and New York: 1888. Houghton, Mifflin & Company.

This little work, with its odd conceits and homely wisdom, its sententious notes and quaint thoughts, cannot fail to interest a multitude of readers. The merit and significance of this collection of Negro Myths has been fully discussed and analyzed by Mr. L. J. Vance, in Nos. 42, 44, and 46 of THE OPEN COURT, to which we refer our readers. The Negro Dialect gives the book its distinctive charm; it is easily mastered, however, and its humor becomes at once enjoyable.

The *Art Amateur* for August is a little ahead of its season, with its colored print of golden rod and Autumn leaves, which remind us that the short vacation time is rapidly passing away, and that the bracing airs of Autumn will soon call us to the front to take part in the busy work or active fight of the world. The summer has been ill spent which does not leave us the fresher and stronger for our tasks, be they what they will. There is no dog-day languor about "My Note Book" which is full as ever of lively gossip about artists and traders in art. It is humiliating to hear that Artists have their tricks of the trade, in duplicating and forging their own pictures to increase the sale, but picture-makers

are but men, and where they work only for money, why should they be more scrupulous than others about the means of obtaining it? We are proud of those who have shown themselves to be artists in soul as well as by profession, by protesting against that narrow policy miscalled protection, which would place a tax on the true means of generous emulation and efforts for improvement. How long must the enlightened States of America be classed with Hawaii and Corea and Honduras and New Zealand who tax foreign pictures by the pound or the penny worth. Art can be expected to be nothing but manufacture or merchandise where it is so held by the rulers of the people. The *Atelier* is specially rich this month both in its essay on Landscape Painting, well illustrated, and in its directions for decorative work. One article on Dogs is accompanied by many vivid sketches of these intelligent and very individual animals, while another called "A Talk with Mr. James Beard on the Painting of Dogs," is more than technical and shows the young student how he must observe them in order to catch their expression and action. In response to questions in regard to the Photo-Engraving processes, the editor says "An article or a series of articles, practical and well written, on these subjects would be accepted by the *Art Amateur* and paid for." Surely there must be those competent to write such articles which would be very welcome to readers. The value and applications of these processes are important practical questions to many who need to reproduce photographs on other works of art. E. D. C.

In the sonnets of Mr. Belrose published in THE OPEN COURT of May 17, and August 2, of the present volume, a mistake was made by the printers in the arrangement of the lines. The position should have been according to the rhyme, which was not between alternate lines, as the form in which the sonnets were printed indicated.

THE LOST MANUSCRIPT.*

BY GUSTAV FREYTAG.

CHAPTER XXI.—Continued.

The Prince plunged his spoon into the mess, took out some of the half-made butter, and spread it on his white bread with a feeling of satisfaction that was quite new to him. "It tastes a little sour, Krüger," he said.

"Of course," replied Krüger; "the butter-milk is still in it."

"It does not matter," said the Prince, consoling himself. "Krüger, I did not think there was so much to be attended to in churning."

"Yes, all things are difficult in the beginning," replied Krüger, cheerfully.

"It is all right," concluded the Prince, graciously; "take the machine out, and clean it properly."

After that the churn stood peacefully under the silk cloth; the Prince in his lonely hours, would sometimes stand before it, and revolve in his mind how he could deliver it into the hands of the person for whom he had secretly intended it.

The stars themselves appeared to favor him; for the revolving earth had rolled into the last sign of the zodiac, which guides the souls of our people with magic power to the most charming festival of the year. Christmas was near, and the ladies of the street near the Park moved about in secret activity. Intercourse with intimate acquaintances was interrupted, books that had been begun were laid aside, theatres and concert-rooms were empty; the tones of the piano-forte and of new bravuras rarely sounded to the rattling of carriage-wheels in the street; inward struggles were hushed, and bad neighbors little thought of. From morning to evening, little fingers were occupied with beads, wools, silk, paint-brush and palette; the day lengthened into eight-and-forty hours; even during the minutes of unquiet morning slumber, obliging crickets and other invisible spirits worked in the pay of the ladies. The nearer the festival approached, the more numerous were the secrets: in every closet were concealed things which no one was to see; from all sides, packages were brought into the house, that were forbidden to be touched. But whilst the other inmates of the house secretly slipped past one another, the lady of the house was the quiet ruler in the invisible realm of presents, and the confidant and clever adviser of all. She was never weary; she thought and arranged for every one; the world had become to her like a great cupboard with numerous compartments, from which she was incessantly fetching things, and in which she was always cautiously stowing covered packages. When on Christmas Eve the spangled stars shine, the wax-lights drip, and the golden balls glimmer and glisten on the Christmas tree, it is then that the fancies of the children celebrate their great day; but the poetic vision of the housewife and her daughters, for months before, have filled the room with joyful splendor.

If one may regard the judgment of Mr. Hummel as valid, it is rarely that the enthusiasm of Christmas week is fully developed in the men who have the honor of being the representatives of the family. "Believe me, Gabriel," said Mr. Hummel, one December evening, as he was watching some children who were passing by with toys, "at this time man loses his importance; he is nothing but a money-chest, in which the key is turning from morning till evening; the best wives become barefaced and foolish, all family confidence vanishes, everybody avoids everybody else, the order of the house is disturbed, one's night's rest is unscrupulously destroyed; when it is meal time, one's wife runs to the market, and when the lamps ought to be extinguished, one's daughter begins a new piece of embroidery. When at last the long bother is over, then one must be delighted at a pair of new slippers which are an inch too short, and for which later on one has to pay a long shoemaker's bill, and to be pleased with a cigar case of beads, which is flat and hard, like a dried flounder. Finally, after one has

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*Translation copyrighted.

shot out golden sparks like a rocket, the ladies expect one to show one's good feeling by making them a present. Now, I have trained mine differently."

"But I have seen you yourself," rejoined Gabriel, "with a package and bandbox under your arm."

"That is true," replied Mr. Hummel, "a bandbox is inevitable. But, Gabriel, I have given up all worry; for that was the most humiliating part of the affair. I go every year to the same milliner now, and say, 'a hood for Madame Hummel;' and the person says, 'You shall be served, Mr. Hummel;' and she places the structure ready made before me. Besides this, I go every year to the same shop and say, 'I want a dress for my daughter Laura, at such and such a price, more or less,' and a dress well worth its value is placed before me. In confidence I must tell you I have a suspicion that the women have seen through my trick, and select the things themselves beforehand, for now they are always very much to their taste, whilst in former years they were often objected to. They have the trouble now of selecting the finery, and in the evening they practice all sorts of dissembling artifices, unfold and examine the goods, pretend to be astonished, and praise my excellent taste. This is my only satisfaction in the whole childish amusement. But it is a poor one, Gabriel."

Such was the discordant strain in which the master of the house indulged; but the dwellers in Park Street cared little for it, and like opinions will always be regarded with like indifference. So much sweeter is it to care for others than for one's self, and so much happier to give pleasure than to receive it.

For Ilse also the festival this year was to be a great event; she collected like a bee, and not only for the dear ones at home; in the city also she had nestled many great and little children in her heart, from the five young Raschke's down to the little barefooted creatures with the soup-pot. The sofa-corners assumed a mysterious appearance whenever her husband, or Laura, or the Doctor entered unexpectedly.

When the Chamberlain, some time before the holidays, deemed it becoming for his Prince to pay a visit to the new Rector, the gentlemen found Ilse and Laura busily at work, and the parlor of the Rector's wife was changed into a great market stall. On a long table stood little Christmas trees, and full sacks were leaning against the legs of the table; the ladies were working with yard-measures and scissors, dividing great hanks of wool, and unrolling pieces of linen, like shop-keepers. When Ilse met the gentlemen and made excuses for the state of her room, the Chamberlain entreated her not to disturb herself. "We will remain here only if we are allowed to make ourselves useful." The Prince also said, "I beg permission to help, if you have anything for me to do."

"That is very kind," replied Ilse, "there is still much to be done before evening. Permit me, your Highness, to give you your work. Pray take the bag of nuts; and you, my Lord Chamberlain, have the goodness to take the apples in charge; you, Felix, will have the gingerbread. I beg the gentlemen to make little heaps, to each twenty nuts, six apples, and a package of gingerbread."

The gentlemen went zealously to work. The Prince counted the nuts conscientiously, and was provoked that they would always roll together again, but discovered that he could keep the portions apart by means of strips of paper folded together. The gentlemen laughed, and related how once, in a foreign country, they had introduced this German Christmas amusement. The perfume of the apples and of the fir-trees filled the room, and gave a festive feeling to the souls of all present.

"May we ask the kind lady who are to benefit by our exertions?" said the Chamberlain; "I hold here an uncommonly large apple, which I hope may fall to the lot of one of your favorites. At all events, we are doing what will give the poor children pleasure."

"Finally it will," replied Ilse; "but that is not all; we shall give this to their mothers, for the greatest pleasure of a mother is to give presents herself to her children, to adorn the Christmas tree and to work what the little ones need. This pleasure we shall not deprive them of, and therefore we send them the stuff unmade. The Christmas trees, too, they prefer buying themselves, each according to their tastes; those you see here are only for children who have no mothers. These trees will be adorned by us. Everything for the festive evening will be carried out of the house today, so that the people may receive them in good time, and arrange them for themselves."

The Prince looked at the Chamberlain. "Will you allow us," he began, hesitatingly, "to contribute something towards these presents."

"Very willingly," replied Ilse, joyfully. "If your Highness wishes it, our servant can look after it immediately. He understands it, and is trustworthy."

"I should like to go with him myself," said the Prince. The Chamberlain listened with astonishment to this idea of his young master; but, as it was laudable and not against instructions, he only smiled respectfully. Gabriel was called. The Prince, much pleased, took his hat. "What shall we buy?" he asked eagerly.

"We want some little tapers," replied Ilse, "besides some playthings;—for the boys, leaden soldiers; and for the girls, little kitchen things; but all must be strong and cheap." Gabriel followed the Prince out of the house with a large basket.

"You heard what the lady ordered," said the Prince, in the street, to Gabriel. "First the wax-tapers; you do the selecting and I will pay. We are to buy them cheap; see that we are not cheated."

"We need not fear that, your Highness," replied Gabriel; "and if we should pay a few pennies too much, other children will benefit by it."

At the end of an hour the Prince returned. Gabriel had a heavily-laden basket, while the Prince also carried under his arms bundles of toys and large paper bags full of sweetmeats. When the young gentleman entered thus loaded, with color in his cheeks and as happy as a child, he looked so good and pleasing that all were delighted with him. He unpacked his treasures before the Professor's wife, and emptied the contents of the paper bags on the table.

His embarrassment had disappeared: he played with childish pleasure with the pretty things, showed the others the artistic work in the marchpane plums, begged of Laura to keep a candy knight-templar for herself, and moved about and arranged everything so gracefully and actively on the table that all looked at him with admiration and joined in his childish jokes. When the ladies began to adorn the Christmas trees, the Prince declared he would help them. He placed himself before the saucer with white of egg, and was shown the way to lay it upon the fruits and then roll them in gold and silver foil. Ilse arranged as a prize for the gentleman who worked best and did most, a large gingerbread lady with a hooped petticoat and glass eyes; and a praiseworthy contest arose among the gentlemen to produce the best things. The Professor and the Chamberlain knew how to employ their old skill; but the Prince as a novice worked somewhat carelessly—there remained some bare spots, and in others the gold foil bulged out. He was discontented with himself, but Ilse cheered him, saying, "But your Highness must be more sparing with the gold, otherwise we shall not have enough." Finally, the Chamberlain obtained the lady in the hooped dress, and the Prince, as an extra reward for his activity, a babe in swaddling-clothes which looked on the world with two glassy bead eyes.

Out of doors in the Christmas market, little children were standing round the fir-trees and Christmas shops, looking hopefully and longingly at the treasures there. And in Ilse's room the great children were sitting at the table, playful and happy. Here there were no cautious admonitions, and the Prince painted the outlines of a face with the white of egg on the palm of his hand, and gilded it with a gold-foil.

When the Hereditary Prince rose to go, the Professor asked, "May I venture to inquire where your Highness intends to pass Christmas Eve?"

"We remain here," answered the Prince.

"As some remarkable musical performances are in prospect," added the Chamberlain, "his princely Highness has denied himself the pleasure of having the Prince with him at this festival; we are, therefore, to pass a quiet Christmas here."

"We do not venture to invite you," continued the Professor; "but in case your Highness should not pass this evening in other society, it will be a great pleasure if you would do so with us."

Ilse looked thankfully at her husband, and the Prince this time did not leave it to the Chamberlain to answer, but eagerly accepted the invitation. As he walked with his attendant through the crowded streets, he began, cautiously, "But we must contribute something to the Christmas table."

"I had just thought of that," replied the Chamberlain; "but if your Highness honors those worthy people with your company that evening, I am not sure how your Highness's father will approve of a contribution to the Christmas tree from my gracious Prince."

"I do not wish it to be any of those eternal brooches and ear-rings from the court jeweler's cases," cried the Prince, with unwonted energy; "it should be some trifle; best of all, something as a joke."

"That is my view," assented the Chamberlain; "but it is advisable to leave the decision to his Grace, your father."

"Then I had rather remain at home," replied the Prince, bitterly. "I will not enter with some stupid present in my hand. Can it not be managed that the visit be without any ceremony, just as the invitation was?"

The Chamberlain shrugged his shoulders. "A few days afterwards the whole city will know that your Highness has shown Professor Werner this unusual honor. Without doubt the occurrence will be reported to the palace by persons who have no business to do so. Your Highness knows better than I do how your father will receive such an account, coming to him first from a stranger."

The Prince's pleasure was spoilt. "Write, then, to my father," he cried, angrily; "but represent the invitation just as it was given, and express yourself as opposed to any conventional present from the court: it would only wound this family."

The Chamberlain rejoiced in the tact of his young master, and promised to write the letter as he desired. This appeased the Prince, and after a time he began: "It has just occurred to me, Weidegg, what we should give. As the Professor's wife comes from the country, I will present her with the machine which I lately bought, as a case for pretty *bonbons* or something of that kind, that I will put in it."

"Now he wishes to get rid of the useless play-

thing," thought the Chamberlain. "That is impossible," he replied, aloud: "Your Highness is not quite sure whether the lady would take the joke as it is intended. It would not do to give a present which might give rise to misinterpretation. Your Highness should on no account venture upon such a thing. Even if the amiable lady herself did not object, it would be much discussed in her circle. Your Highness's joke might be easily considered as an ironical allusion to country manners, which undoubtedly become the lady well, but might here and there occasion a slight smile."

The Prince's heart froze within him; he was furious with the Chamberlain, and, on the other hand, shocked at the thought of wounding Ilse. The poetry of the festival was entirely spoilt for him. He went silently to his apartment.

The answer to the Chamberlain's letter was to the effect that the Prince, in spite of the apparent unsuitability, would not object to an incidental visit, and that, if some mark of attention was unavoidable, it might be procured from a gardener or confectioner. The Chamberlain, therefore, bought a quantity of flowers and sweetmeats, and laid them before the Prince. But he looked cold and silently on the gay bright colors. Towards evening two lackeys carried the things to the Rector with a little note from the Chamberlain, in which, in the name of his Most Serene Prince, he begged the accompanying gift might be applied to the ornamenting of the Christmas tree. Meanwhile the Prince stood gloomily before his butter-machine, and quarrelled bitterly with his princely dignity.

When at the proper hour he entered Werner's apartment, the Christmas gifts had been distributed and the candles extinguished. Ilse had done it purposely. "It is not necessary to let these strangers see what delight we take in these presents." The Prince received Ilse's thanks for the splendid adornment of her table with reserve, and sat before the tea-kettle silent and absent-minded. Ilse thought, "He is sorry that he has had no glad Christmas Eve: the poorest child is merry with his Christmas tree, and he sits as if shut out from the pleasures of this happy time." She made a sign to Laura, and said to the Prince: "Would your Highness like to see our Christmas tree? The lights had to be extinguished lest they should burn down, but if your Highness likes we will light it up again in all its splendor, and it would be very kind of your Highness to help us."

This was a welcome proposal to the Prince, and he went with the ladies into the festive room. There he offered to take the staff, at the end of which a wax-taper was fastened, in order to reach the highest lights of the mighty tree. Whilst he was thus busily working at the tree his heart became lighter, and he looked with interest at the presents which were lying under the tree.

"Now will your Highness have the kindness to go out of the room," said Ilse, "and when I ring it will signify to you and Mr. von Weidegg that your Highness is wanted."

The Prince hastened out; the bell rang. When the gentlemen entered they found two small tables laid out; on them small lighted trees, and under each a large dish of pastry, made after the fashion of their own country. "This is to be a remembrance of our home," said Ilse, "and on the trees are the apples and nuts which you have gilded: those with the red spots are your Highness's work. Here is a respectful gift sent from the farm of my dear father. I beg the gentlemen to eat this smoked goose's breast with a good appetite; we are not a little proud of this dish. But here, my gracious Prince, there is, as a keepsake from me, a small model of our churn; for this is at what I served my apprenticeship as a child." On the Prince's seat stood this useful instrument, made of march-pane. "On the bottom of it, your Highness, I have written my motto of long ago. May the gentlemen accept my good intentions!"

She said this so joyously, and offered her hand to the Chamberlain so kindly, that all thoughts of his dignity were forgotten, and he shook her hand right honestly. The Prince stood before his machine, and thought: "Now is the moment, or never." He read below the simple words, "If a person has devoted himself with honest perseverance to some one thing, it will be a blessing to him throughout his whole life." Then, without any thought of the threatening consequences of his daring, he said: "May I propose an exchange to you? I have bought a small churn; it has a large wheel and a small one for turning, and one can churn as much as one wants each morning. It would be a great pleasure to me if you would accept this."

Ilse thanked him with a bow; and the Prince requested that a servant might at once be sent to his apartment for it. Whilst the Chamberlain was still reflecting with amazement on the strange coincidence, the piece of mechanism was brought into the room. The Prince placed it with his own hands upon a corner of the table, explained the internal arrangements to the company, and was much delighted when Ilse said she had confidence in the invention. He was again the joyous child of the other day, gaily drank his glass of wine, and, with charming grace, proposed the health of the master and mistress of the house, so that the Chamberlain scarcely knew his Telemachus again. On taking leave, he himself packed up the marchpane and carried it home in his pocket.

(To be continued.)

WILLIAM J. POTTER.

In the leading essay of No. 1, Mr. Potter discusses the question of the relation of individual existence to the aggregating power and well being of society. Nature in this matter should be our teacher, and the spinal world-plan of nature is the method of differentiation. It is a process of concentrating the forces of existence which is done through the process of self-preservation. This principle of selfism is means only, not an end. Without it there would be stagnation, but the individual organism does not exist for its own sake. Nature's aim is higher, broader, richer life. The end of individual existence is the common good, the general well-being, and here is where the law of ethics and the obligations of religion bear upon social problems. Individual self-interest and enterprise only furnish the rough materials for the meliorations which mark the progress of the higher civilization.

ERNST MACH.

Ernst Mach (Professor of Mechanics at the University of Prague, author of several works explanatory of the history and philosophy of mechanics, and the first authority in his branch) explains in his essay *Transformation and Adaptation in Scientific Thought*, (in Nos. 46 and 48), one of the most characteristic ideas of modern science—an idea that lies, so to speak, in the atmosphere. "Knowledge," he says, "is an expression of organic nature." The law of evolution, which is that of transformation and adaptation, applies to thoughts just as well as to individuals or any living organisms. A conflict between our customary train of thought and new events produces what is called the problem. By a subsequent adaptation of our thought to the enlarged field of observation the problem disappears and through this extension of our sphere of experience the growth of thought is possible. Thus the happiest ideas do not fall from heaven, they spring rather from notions already existing. From this standpoint the narrow conception of egotistic views disappears. "The person" is comparable to an indifferent and symblical thread on which are strung the real pearls of life—the ideas that make up the changing content of consciousness. Humanity in its entirety is like a polyp plant; the material and organic bonds of union have been severed, but by this freedom of movement, the psychical connection of the whole has been attained in a much higher degree.

MONCURE D. CONWAY, on Agnosticism, in No. 47.

Mr. Moncure D. Conway, in reference to the philosophical exposure of Agnosticism in the editorial article of Nos. 43 and 44 of THE OPEN COURT, declares that the Unknowable cannot in the least concern the religious nature. Only weariness of wing can have brought free thinkers to seek rest on this raft. Religion does not follow abstract and vague gods, it follows Jesus, Buddha, Mary, who may be known and loved. On the truth and moral value of these great figures, man can base his life. Mr. Conway concludes with the remark that the ethical side of monism has not as yet been made clear. Nature seems predatory and cruelly impartial between good and evil. Adherents of error survive more comfortably and increase more extensively than the disciples of truth. May it not be more truly said that there is a moral law in man to which nature must conform in order to be elevated and transfigured to a nobler existence? Mr. Conway's critical remark if it were unanswerable from the standpoint of Monism would drive religion and philosophy back into the dualism and supernaturalism of former times. And truly the supernatural, if it is justifiable at all, must be recognized in the moral nature of man, unless man is proven to be a part of nature. The editor's answer to Mr. Conway's criticism, in the same number, expatiates on the Oneness of Man and Nature, thus showing that humanity, culture and civilization are but a higher stage of the natural, and that morality does not stand in contradiction to, but is an observing of and a conforming to the cosmical order of the All.

W. D. GUNNING.

Mr. W. D. Gunning's essay *Katzenjammer*, in No. 1, is a sprightly, half humorous, half serious lay sermon, sending shafts of light into the dark recesses of the mind. Katzenjammer is a German word, which means cat-sickness, and denotes a malady of body and mind which results from night-life. The owl, the night-hawk, the whip-poor-will and all the felines are night-prowlers. Men also have gone astray with the cats and become nocturnal; even Socrates, with all his virtues was somewhat addicted to Katzenjammer. Katzenjammer was a large factor in the decline of Athens and the chief factor in the fall of Rome. What a Katzenjammer's-band was that of Cataline! What Katzenjammer was that of Nero fiddling in the light of burning Rome! Struggle for life drove one member of a certain family higher into the air, and another into the ground. The sun-seeker gained in eye and brain, the earth-burrower lost its eyes and retained only brain enough to guide it through the ground. Such are the fates of the mole and the bat. Igdrasil the tree of life has been pushing its human fruit inward to the shade. We want a peripheral humanity lit by beams of science and sweetened and mellowed by active rays of the sun of righteousness.

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